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A Packaging/foodservice analysis: a fruit-filling study

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A PACKAGING/FOODSERVICE ANALYSIS:

A FRUIT-FILLING STUDY

by

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER I

INTRODUCTION

It's Thursday night and Don has just come home from a work day which included several long meetings, conference calls, and confrontations with his boss. It's now 7 o'clock and he finds himself frustrated, exhausted, and hungry. He calls Amy, his girlfriend, and arranges a late dinner at the local family restaurant. They both decide to make a meal of the restaurant's 100 item salad bar which includes everything from soup to nuts. After several trips to the salad bar, Amy and Don call it an evening realizing they have a busy Friday ahead. As Don is ready to retire for the evening, he starts to experience discomfort in his abdominal area, thinking he overindulged himself. Don wakes up in the morning with the same discomfort and once again excuses it as being overtired, knowing he can get through the day because the weekend is around the corner. Throughout the course of his morning, Don has to make several trips to the bathroom to fight off nausea, diarrhea and fluctuations in his bodily temperature. Finally, Don starts vomiting and leaves work because he is ill, telling his boss he has "a touch of the flu."

There are several possibilities why Don had to leave work relating to the previous night. These include, and are not limited to:

1. Improper holding temperature of food on salad bar;
2. poor sanitation of employees and/or salad bar unit;
3. poor management of foodservice operation;
4. packaging of foods on salad bar were deficient and lead to the degradation of product quality by the transmission of bacteria.

We live in a highly technical and accelerated society. The demands from our occupations, our family and social obligations have left us with little time for the preparation and consumption of high quality, healthy and nutritionally sound foods. Many food industry analysts predict by the year 2000, over 80% of all food consumed will take place away from the home (Leonard, 1983).

STATEMENT OF PURPOSE

The purpose of this study is to examine the role of packaging in the commercial foodservice industry. In general it will examine the identification and evaluation of purchasing criteria as they relate to foodservice purchasing.

STATEMENT OF PROBLEM

Due to the vast variety and diversity of foods it will be necessary to narrow the scope of this investigation to one food product, fruit filling. This was done so that proper research and sufficient time could be allocated for a thorough and detailed study.

This particular product line was chosen due to its overall use in differentiated market segments in the foodservice industry. Fruit fillings are a commodity based product. Hence, this study area may be researched with possible ramifications extended to other types of commodities. Because the purchasing function has a direct impact on profitability to the foodservice operator, this area requires attention and study.

The central problem of this study was centered on the effects that various means of packaging fruit filling have on the purchasing decision of foodservice operators. More specifically, this study addresses the question: "Does packaging have an effect on the foodservice operator when he/she is buying fruit fillings?

In order to facilitate this investigation, three sub-problems were examined:

1. What are the perceptions of the characteristics of fruit fillings in relation to the type of packaging (i.e., canned, fresh, frozen, plastic pail).

2. What factors influence the purchasing of the various types of package design?

3. What criteria in terms of ranking importance in various packaging qualities have on the purchase decisions?

Scope of the Research

The foodservice industry received 40% of all consumer expenditures for food which represents $185.8 billion, according to 1985 figures (National Restaurant Association, 1985-1986). The fruit processed and fresh fruit market represents a total of 10% of all food purchased resulting in an $18 billion dollar expenditure (Epperson, 1986).

Limitations to the Study

Fruit filling was selected as the primary product under investigation because it is widely used in the foodservice industry, and so it provides an excellent overview of all the food service markets. These types of staples in the

foodservice industry lend themselves easily to detailed research that is complete and yet not overwhelming to the researcher. Fruit filling is an extension of a basic commodity such as fruit. The thickening agent is added to the fruit to "add value" so a new product line is developed. This type of research can be used as an initial study for several other commodities found in the market place in refined forms (cereals, vegetables, entrees, etc.)

Definition of Terms

The following concepts are defined in terms of their relevance to the study and to provide a basis for common understanding:

Commercial Foodservice - All establishments where food is served, for a profit consideration, away from home (West & Wood, 1988, pg. 20). This type of foodservice represents the food and beverage being the primary motivation for customer/client flow. For the purpose of this study, commercial foodservice include: fast food outlets, full service restaurants, commercial cafeterias, delis, and lodging foodservice.

Non-commercial Foodservice - All establishments where food is served, for non-profit as a service to a

customer or client. The customers frequent these types of foodservice establishments because of a reason other than the food and beverage. These customers include: students, patients, employees or aged customers. For the purpose of this study, this type of foodservice will included: business/industry, hospital/nursing home, primary/secondary school, and college/university.

Food Packaging - Packaging protects food against a hostile environment. Being biological, food can deteriorate to lose nutrient value; change color, flavor, and masticatory properties; and in some instances can become a toxicological hazard (Barker & Eckroth, 1986, pg. 359). For the purpose of this study, concentration was given to fruit fillings and package designs. The package material may further the shelf life of the product. Furthermore, packaging is used to present the commodity in an attractive form to the buyer (Crosby, 1981, pg. 9).

As Purchased Price (AP) - The cost of an item procured for a foodservice operation in a form dictated by the supplier.

Bulk Purchasing - To buy more than one of an item, usually in a large quantity. For the purpose of this

study, bulk was referred to as a case lot or large package/container.

Portion Controlled (P/C) - A foodservice term commonly referred to as a convenience food. A convenience food is any natural food or a combination of foods to which some form value has been added (Stefanelli, 1985).

Shelf Life - Is the time between the production and packaging of a product and the point at which the product first becomes unacceptable under defined environmental conditions. It is a function of the product, package, and the environment through which the product is transferred, stored and sold (Barker & Eckroth, 1986, pg. 578).

Organization of the Following Chapters

Chapter II summarizes the review of the literature with the following subsets of topics: a review of the literature on the food industry as it relates to the commercial selling in foodservice; a review of the literature in regard to the influences of product, package and service on the purchase criteria of foodservice operators; and, a review of the literature on specified packaging of fruit fillings.

Chapter III focuses on specific packaging of fruit fillings (questionnaire) and the statistical analysis and design of this study (see Apendix C).

Chapter IV presents the findings from the measurement instrument (i.e. questionnaire) and discusses the relationship of these findings to the common understandings developed through the review of the literature.

Chapter V presents the summary, conclusions, and recommendations for further study.

CHAPTER II

REVIEW OF THE LITERATURE

This chapter examined the relevant literature focusing on the needs of the foodservice industry in regard to the packaging of food products. Three areas of concentration were reviewed. First, the scope of the food industry as it relates to the commercial selling of food is examined. It includes a background of past, present and future foodservice operations. Second, the facts that influence the purchasing criteria of foodservice operators were explored in regard to product, service and packaging. Finally, attention was given to the specific packaging options (plastic pails, fresh, frozen, and canned), involving the specific ways fruit fillings can be purchased.

SCOPE OF THE FOODSERVICE INDUSTRY

The background of the foodservice industry is presented in this chapter. This is done in order to let the reader gain perspective and an appreciation for past, present and future foodservice operations. This overview of the progression of the foodservice industry covers the many different types of establishments that serve food to groups of people outside the family home.

Foodservice operations in the United States are very much a part of the fast paced American lifestyle. These foodservice operations are not newly created innovations but have roots as far back as the Middle Ages. In countries such as France, Germany, England and Sweden foodservice operations were well organized. The consumption of food was perceived as a social event in which the entire family and guests took part. Since the preservation of food was all but non-existent, and transportation without spoiling was impossible, food had to be prepared and cooked immediately by well organized and well supervised kitchens. Therefore, these countries have helped contribute to the shaping of institutional foodservices.

Religious orders and royal households were among the earliest pioneers of quantity food production. They had a strong hand in the development of foodservices. Abbeys along the countryside, especially in Great Britain, served not only the large amount of brethren but thousands of pilgrims who came to worship. The royal household and noble households numbering up to 200 people, also needed an institutional-size foodservice. In the United States, the Country Inn and Stage Coach Depot served a similar function to these European households.

The provision of meals as well as rooms for college and

university students has been a custom for many years. Yet, the twentieth century has seen many changes in the style of foodservice on college campuses. In earlier times, seated table service was prevalent with student rotating as service personnel. By and large meal times was very strict. As time progressed, this type of dining gave way to the leisurely, efficient style of cafeteria service. The service style makes it possible to make student demands for greater menu variety and the catering to food preferences of various ethnic groups that make up today's student body. Current trends in this style of foodservice must now also observe physical fitness and weight control attitudes of students. Dietary requirements are changing with an increased demand for variety and nutritious foods. The foodservice manager is forced to be more creative to meet these demands. In addition to residence hall dining, a more diverse system of foodservices exist on today's campus. Student union buildings have set up creative and innovative units catering to student's changing food interests and taste. Commercial fast food companies have been a major competitor for student unions in college commissaries, with some even located on campus. Further, the use of college and university dining facilities as laboratories for foodservice management classes is a common practice. This is due in part to the demand by foodservice industry for quality hospitality management education (West & Wood, 1988).

School lunch has been associated with the development of public education. It has been shaped by the many changes in legislation dictating policy and financing. The type of organization and management found in school foodservices depend much on size and the location of the school. Small independent schools have simple on-premise food production together with service overseen by only one or two employees. Large city school systems often use a central production kitchen and deliver meals for service to particular units within the system. In 1984, Restaurants and Institutions magazine reported that school foodservice ranked fourth among all types of organizations in terms of dollar expenditures (West & Wood, 1988). This is no small business serving the nutritional needs of children (Radzikowski, 1983).

Clubs and other social organizations have existed for many years. Membership dues and other foodservices provided funds to make a club house or some building that included foodservice facilities. Presently, city clubs, athletic clubs, faculty clubs and country clubs, to mention a few, complete with the surroundings of hotels compete for foodservice standards. These clubs usually cater to such events as cocktail parties, banquets, wedding receptions, bridal showers and political gatherings, not to mention providing food to all its members (Woodman, 1984).

The development of foodservices in hospitals is similar to that of college and university foodservice. Meals in early day hospitals were simple to the excess of boredom and with no effort to provide any special foods or therapeutic diets (West & Wood, 1966). Changes over the next century in hospital foodservice included centralized tray service and mechanical dish washing, thus providing a separate kitchen for special diet preparation (Berkman, 1983). Also, pay cafeterias for staff and employees and separate dining areas for these two groups were established. Presently, hospitals are a category of institutions operated and funded by several governing bodies including federal, state, county and city governments; by religious orders; or are privately owned. Innovations and changes have made hospitals more efficient especially in the dietetic and foodservice areas. Technological advancements have effected foodservice systems, with creative innovations to improve methods of food production, holding, distribution, and service. Computer use for many routine functions and the use of robotics in some foodservice areas also help to improve conditions.

Nursing homes and other health care facilities have come into their own in recent years (Food Management, 1985). With the increase in demand for nursing home care growing at an accelerated rate, so have increased demands for quality foodservices facilities. Factors influencing this growth

include population growth, longer life span, increasing number of the elderly making up the total population, urban living with compact housing units, increased incomes and greater availability of heath insurance benefits. Foodservice plays an important part in the existence of most nursing home patients. For many of these people, it is the one thing they have to look forward to each day. Thus the quality and amount of food offered, whether it be in a dining room or individual rooms is very important to the overall success of the operation.

Other health care centers include homes for specialized groups such as the handicapped, orphaned, abused, the rehabilitated and correctional institutions. A well-balanced, nutritious diet is essential for these types of clients. Health care units such as day care centers and senior citizen centers also need adequate foodservices to attend to those participant's needs.

The development of group living and dining facilities for retirees, people reaching the retirement stage of their life, have established a new type of need for foodservice in what is called retirement residences and adult communities. Since health care is the most important service provided, nutritionally adequate and well-balanced meals are essential, whether it is one meal a day or full-service meals several

days a week. Serving food to employees at their place of work has been a necessity since the early times when labor was forced or hired to work in the fields (West & Wood, 1988). The importance of industrial and business foodservices (employee feeding) has developed as manufacturing increased as an important cog in the American economy. Presently, employee feeding for office building workers has become extremely popular, being able to save the employee valuable time for their short lunch or dinner break.

The development of public eating places in the early days was stimulated by people's desire to travel, for spiritual and commercial gain (West & Wood, 1988). As a result, early inns and taverns were the finest types of commercial foodservice facilities. Poor service, stagnant menus and unsanitary conditions were prevalent during this era.

From the cook shops of France originated the restaurant concept. These operations were licensed to prepare ragouts or stews to be eaten on the premises or taken to inns or homes for consumption. The shops had menus posted on the wall or by the door to the interest of travelers (West & Wood, 1988).

Cafeterias took on a new concept, foreseeing the

development of the commercial foodservice industry. This style of service is regarded as an American innovation and originated in the gold rush days of 1849 (West & Wood, 1988). Presently, commercial cafeterias still represent an important part of the foodservice industry.

Another innovation created by American ingenuity was a concept called the automat. This "waiterless" style restaurant was patterned after a cafeteria style foodservice but the main attraction was vending (Cohen, 1986). Vending has enjoyed its share of success today, seen in most institutional type settings.

The fast food concept arrived on the scene of the commercial foodservice industry in 1960, when a chain of hamburger "drive-ups" went public. This has been the fastest growing segment of foodservice presently, with everything from soup to nuts being offered to the public in a simplistic form and manner.

A major segment of today's foodservice industry is provided by airlines, trains and cruise ships. For all of these, service, production and consumer needs and shelf life are a few of the challenges faced by transportation companies (Smith & Schechter, 1984).

The commercial foodservice industry can be defined in its broadest sense to be all establishments where food is served, for a profit, away from home. Included are the formal a la carte or table d'hote restaurants with hotel/motel dining rooms, coffee shops, soda fountains, department store dining rooms, speciality ethnic restaurants, and ample informal fast food outlets. Many of these operators have expanded services to include meals or take out products such as baked goods, jellies and jams, sauces, and salad dressings to name just a few. Every possible style of service is found within these segments of the foodservice industry: cafeteria, counter, table, drive-in and stand up.

This brief history of the development of quantity foodservice provides a perspective for the foodservice industry as it is today. National Restaurant Association statistics indicate an astonishing growth in the foodservice industry: a sales increase from $42.7 billion in 1970 to $185 billion in 1986 (National Restaurant Association, 1985-1986)! This represents nearly 5 percent of the United States gross national product. People in the United States alone presently eat out an average of 3.7 times per week and every indication shows an increase in this figure. Foodservice is the number one employer among all retail businesses, with 8 million people employed, of which two-thirds are women and one-fourth are teenagers. Every individual in the United

States will have direct personal contact with foodservices in institutions at some time during their life (National Restaurant Association, 1986).

The foodservice industry is complex, fast growing, and ever changing. Many factors effect growth and status, including socio-economic conditions, demographic shifts, and changing food habits and desires of the American people. Today there are approximately 561,000 foodservice units in the United States, with one of every four meals prepared, served and consumed outside the home (National Restaurant Association, 1985-1986). The foodservice owner/operator/manager must keep in tune with these constant changes if they are to be successful in serving the public, while being profitable.

Foodservice, as an industry, is broad in scope and encompasses a wide range of establishments. Restaurant Business classifies them into three major groups: 1) commercial/contract, 2) institutional/internal, and 3) military (continental U.S. only) (Restaurant Business, 1984). These three groups are identified according to the various market segments and are identified in Table 1. Each of these operations has its own objectives and goals, all seeming to be very different in style and organization.

TABLE 1

MAJOR SEGMENTS OF THE FOODSERVICE INDUSTRY

Eating and Drinking Places

- Full Menu Restaurants and Lunchrooms
- Limited Menu Restaurants
- Public Cafeterias
- Social Caterers
- Ice Cream, Frozen Yogurt, and Custard Stands
- Bars and Taverns

Hotel and Motel Dining Rooms

The Retail Market

- Department Stores
- Variety and General Stores
- Drugstores, Supermarket Dining
- Convenience Food Stores
- Other Specialized Retail Stores (Take-Outs, and Gourmet Foods as in Shopping Malls)

Business/Industry Market (Employee Feeding)

- Contract Foodservice in Plants
- Contract Foodservices in Business Offices
- Internal (Company Operated) Foodservice - Plants & Business
- Waterborne Employee Foodservice
- Mobile-on-Street Catering
- Food Vending machines
- U.S. Defense Personnel (Military Foodservices)
- Meals Furnished for Foodservice Employees

Transportation Market

- In-Transit Air and Rail
- Terminal Facilities
- Passenger and Cargo Ships
- Interstate Highway Foodservice

Health-Care Market (Internal and Contract)

- Hospitals
- Nursing Homes
- Specialized Care Homes (Retirement Homes, Orphanages, etc.)

Student Market (Internal and Contract)

- Schools: Public and Parochial, Elementary and Secondary
- Colleges and Universities

TABLE 1 (Cont.)

Leisure Market

- Theme Parks, Arenas, Stadiums, Tracks and Museums
- Drive-In MOvie Theaters
- Bowling Lanes
- Summer Camps and Hunting Facilities

Source: Restaurant Business Trade Journal, 1984

However, in reality, all of these establishments have the difficult task of providing foodservice to some segment of the public.

Having been developed from various different origins, the foodservice industry today retains its complexity and yet all are driven by the same overall goal: "to provide a wholesome and appetizing meal to the customer, at a profit".

PURCHASING/PACKAGING IN FOODSERVICE

The second area of this chapter is intended to identify these factors influencing the purchasing decisions of foodservice operators. The product, service and packaging of several specific diversified markets in the foodservice industry is studied to determine how they relate to the purchasing criteria in the various markets.

Purchasing is an essential function in the foodservice industry and is the first step in the production and service of quality food. Because the purchasing activity has a direct impact on profits, it requires as much attention as any other profit making segment of the food industry. Table 2 illustrates the relationship of the purchasing function in the total foodservice operation (Livingston & Chang, 1979).

TABLE 2

Purchasing in Relation to Total Foodservice Production

Production (Functions at the Production Site)	Procurement	Purchasing Receiving Storing
	Preparation	Hot Foods Cold Foods Salads Desserts & Baked Goods Beverages
	Transport	Filling Containers or Portioning if Desired Packaging Delivery User Suitable Temp. Holding Conditions - (Hot, Chilled, or Frozen)
Distribution (Functions at Site Where Food is Served	Receiving	Prepared Foods from Production Site (if Off-Premises)
	Holding	At Appropriate Temperatures until Needed for Service
	Heating	Temperfrozen Foods in Refrigerator Reheat/Chilled; Tempered Foods Before or After Distribution
	Delivery	Centralized or Decentralized Methods
	Service	Self-Service, Table-Service, Tray-Service, Portable Meals Service
	Warewashing	Return of Clean Tableware and Utensils
	Waste	Waste Disposal and Facility Cleaning

Source: Livingston & Chang, 1979

There are several issues to be addressed in the correlation between the foodservice industry and their criteria for the purchasing decisions of food products. The packaging of these food products are going to be paramount in the marketing and distribution to these operations, not to mention the end usage rate of functionability (Epperson, 1986).

A perspective of the flow of distribution for food products is examined in figure 1. As can be seen, the food product travels from farmer to consumer (Paine & Heather, 1983). Throughout the document, this will be relevant to understanding the marketing and packaging cycle of food products (see Figure 2).

As the food product proceeds along its marketing and production channel, changes are made to the food itself. At each stage there is an opportunity to add value to the product by changing its form or otherwise altering the basic food product. There is also an opportunity to increase its value by extending its "shelf life", enhancing its nutritional or physical appeal. Although these processes vary in accordance to the specific characteristics of the food product being processed, in general, the quality of the final product is somewhat related to the packaging process performed at each level. Ultimately, decisions made at the

Figure 1

Flow of Distribution for Food Products

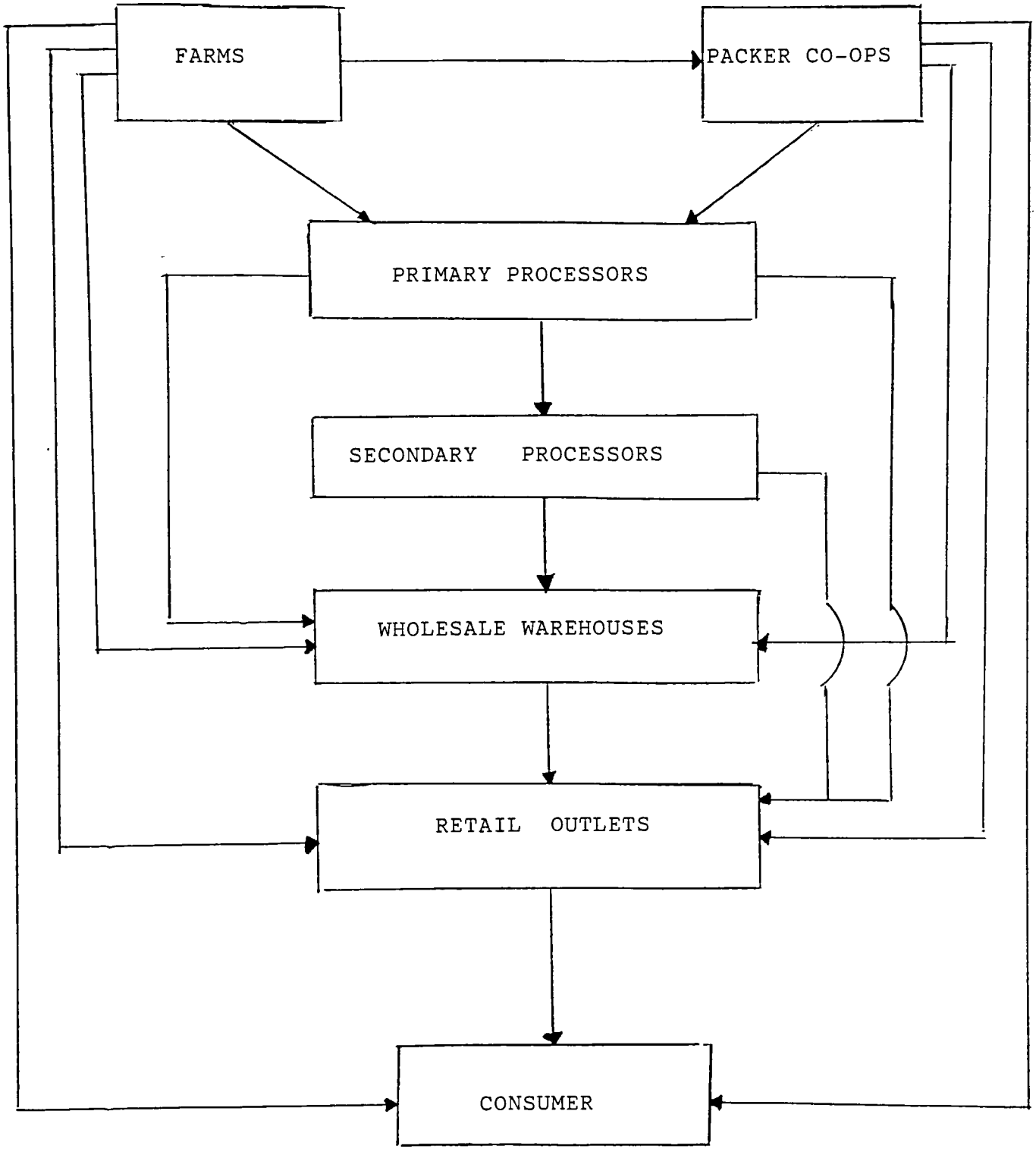
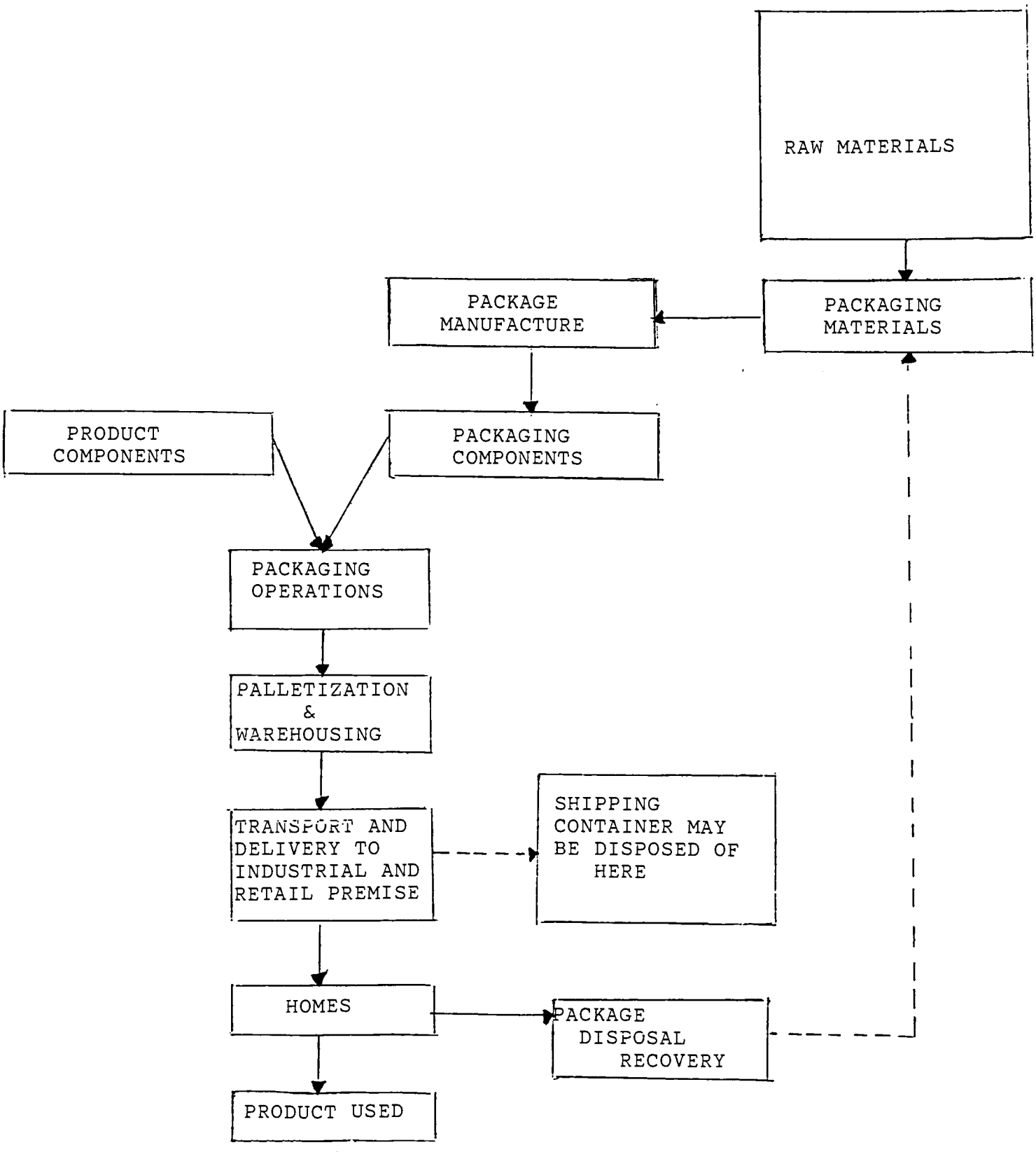


Figure 2

Model of the marketing Process and the Packaging Cycle



early stages of the channel impact the purchasing decisions at later stages.

The packaging of food is a technological-economic function used to minimize costs of delivery while maximizing sales and profits. The value, or even the need of the added functions of packaging, is controversial. Necessity as to whether packaging is a waste of material and energy, or is properly utilized for the conservation of goods and reduction of labor is debatable. However, what packaging of food has instituted is the development of self service techniques to the end user. In the foodservice industry, this has become very popular, with such food operations using packaging directly as: cafeterias, vending and health care facilities. In other foodservice facilities, packaging has an indirect effect in terms of storage, preparation and cost. Also, discussed is overhead of labor to large commissaries and distribution centers has been lowered by the one-step delivery system (Paine & Heather, 1983).

In the following sections, a discussion will commence on specific issues relevant to foodservice purchases in the industry and their perception of the packaging of food products. These issues include the packages' or containers' ability to: 1) control waste of product, 2) be efficient in the storage function, 3) be opened, dispensed and resealed

easily, 4) be portion controlled, 5) be cost effective, 6) extended shelf life of product, 7) be efficient in inventory control, 8) be disposed of easily, 9) preserve nutrition, and 10) communicate storage and preparation information (Domoy, Marecki, Quinney & Yambrach, 1989-1990).

Waste is an issue that is two-fold in the foodservice industry. The first component in waste is the loss of food product. There are many food service establishments that go bankrupt every year and even more that lose millions of dollars to this problem. This directly effects the profitability of the foodservice establishment where your number one profit is not being utilized to its fullest potential.

The second component of this concept of waste is an environmental issue of container/package disposal. There is an increasing problem with the proper disposal of refuse from the foodservice industry. This particular problem not only effects the food industry but many others, with packaging/container materials targeted for close scrutiny (Green & Amihud, 1979). Environmental concerns on the natural resources of the earth are of great concern and should be evaluated in a delicate manner.

Storage areas in most foodservice operations are

inadequate. The foodservice industry has been notorious for placing the majority of the attention to the "front of the house" area in terms of space allocation in erecting buildings and any ensuing renovations. Packaging of food in various containers can ease storage problems and actually increase efficiency in terms of dry storage versus temperature controlled storage (walk-in coolers, freezers, etc.).

Servicing strategies within the foodservice industry is always a priority with emphasis on convenience for production personnel and the consumer. Ease of opening and dispersing of the food product from a package/container to a customer has been a problem and one that many production meetings have focused. Convenience goods have become increasingly popular, however, the actual convenience may lie not in the food product but the package/container itself. How well these convenience attributes succeed depend on the container's ability to be opened, dispensed, and most recently, resealed. The structure and capabilities the package can perform have a tremendous effect on foodservice success or consumer acceptance.

Within the scope of convenience goods mentioned above, the issue of buying portion controlled products (i.e., products packaged in the portion to be served to the

customer) versus buying in bulk, is always a packaging decision to be evaluated by the foodservice operator. There are advantages and disadvantages to both, whether they're perceived or realized. Advantages for portion controlled goods include: 1) longer shelf-life, 2) ease and convenience in handling, 3) ease for accurate inventory control, 4) less labor intensive, and 5) larger quantity of servings made easier. Disadvantages of portion controlled goods include: 1) a higher AP (as purchased price), and 2) more difficulty in disposal of package/container refuse.

Some of the advantages of purchasing products in bulk are: 1) lower AP price, 2) ease of package/container waste disposal, and 3) larger quantity of cooking made easier. Disadvantages associated with bulk include: 1) increased need for storage space, 2) product spoilage greater, 3) decreased accuracy of inventory, and 4) product turnover is less (i.e., fresher product being received less) (Lunberg, 1984).

Cost effectiveness in the foodservice industry, as in other industries, is an obvious consideration. If any business is to prosper or even survive, financial management and execution is essential. The same applies when we discuss the cost versus benefit of food packaging. A major concern of foodservice professionals when securing a product for use is the cost of the product. If a food product can be bought

for a substantially lower price, all other considerations may be dismissed (including packaging). This factor alone seems to be indicative in the foodservice industry where cash flow is paramount.

The single, most essential issue of research for the majority of food manufacturing companies is that of increased shelf life (Quinney, 1989-1990). Since food is a very perishable product, devising a process so that food can be stored longer without spoiling would greatly benefit the foodservice operator. With increased technology being the driving force, food manufacturing companies can realize a tremendous upward surge in revenues, and ultimately offer a product that is more efficient. Packaging has and will play an even greater role in this technology improvement process.

As financial management and execution is essential in the foodservice industry, the one most important component of this area is inventory control. Pilferage and theft has become a great problem in foodservice, therefore controlling and administering inventory is vital. Packaging of food products, regardless of form, can help facilitate this control function.

The food marketplace has fluctuated noticeably in the past few years. Consumer demand for more nutritious foods

has increased dramatically (Avery, 1974). The push for health has had a great effect on the food industry with the flood of trendy products being introduced as nutritious, healthy and even therapeutic for consumers. As a result, the foodservice industry has had to respond by offering a healthier menu to a more educated consumer. While in the process of the distribution function, packaging/container structure must meet the nutritional requirements to preserve the food product or minimize the loss of nutritional value (nutrients, flavoring or form of the food product). Packaging being the final link of the production and distribution process for food products, is vital for the success of the complete cycle (Nelson, 1974).

Packaging has been identified as a substantially important component when discussing the purchasing and distribution of food products to the foodservice industry. However, the structure of the package/container is just one aspect of the total benefit packaging can offer the purchaser. The other aspect in the transfer of information is through labeling. Specifically, the transfer of storage and preparation information to the foodservice employee (since he or she is the person who has to produce a final product for the consumer) will be important. Production, packaging, distribution and storage of food may be adequate but if the product is prepared inappropriately, all the other

steps of the purchasing function will be for naught. Even more considerations will have to be made with our society becoming multi-lingual.

In the preceding paragraphs of this section, an understanding of how packaging can specifically effect and influence the purchasing criteria with identification of the specific options, in regard to packaging, that fruit fillings can be purchased.

FRUIT FILLINGS/TOPPINGS

In order to gain an understanding for the development of fruit fillings in the foodservice industry today, a brief introduction of commercial fruit processing is presented focusing on preservation. Included with this introduction, a look at what constitutes fruit fillings, and specifically what packages are used in fruit fillings.

Colonial Americans had an overwhelming selection of fruits to choose from. These native fruits included blackberries, cranberries, raspberries, gooseberries, elderberries, huckleberries, blueberries, strawberries, crab apples, wild cherries, fox grapes, muscadame grapes, persimmons, plums, figs and others (Woodroof, 1986). The processing of fruits was done by native Indians, the English,

Spanish and French settlers according to their native customs. Later, fruits such as apples, peaches, nectarines, apricots, Italian plums, Japanese persimmons, European grapes, atrius fruits, quinces and others were introduced.

Fermented beverages including beer, wine, cider, brandy, cordials and nectars, topped the list of early fruit products. Newer products developed from these are: fruit juices, punches, ades and concentrates. These products are now canned, frozen, dried, powdered, concentrated and fortified.

Drying whole, sliced, pureed or mashed fruits was another early method of preservation. This was the forerunner of the present dried, dehydrated, dehydrafrozen and granulated fruit industry (Woodroof, 1986).

A third method of preserving whole, sliced, or sectioned fruits was to soak them in honey or sugar syrup, or to boil the juice down until it was heavy syrup and treat the fruit with it. Sometimes the fruits or juices were mixed, and occasionally spices were added. This was the front runner of the present methods of making preserves, jams, marmalades, glaze, jelly, bitters, sauces and fruit fillings. Table 3 demonstrates known commercial products made from fruits grown and processed in tropical and temperate areas of Central and

South America and South Asia. Other specialty products made from fruits include bitters; beverage bases; breads and muffins and cookie mixes; frozen, canned and dried chunks; breakfast and cocktail drinks; diet liquids and spreads; and by-products such as pectin, citrus acid, acerbic acid, colors and flavors (Woodroof, 1986).

Most types of fruits can be eaten raw with little preparation. Possibly half are graded and prepared for immediate consumption by a magnitude of recipes; the choice of crop is processed, packaged, and distributed for year-round consumption. Every fruit growing area has its own fruit types and favorite products. Even though most fruit products are used directly as food, others go into confections, baking goods, cosmetic items, pharmaceutical products, diet foods, and other products. They provide a natural source of color, flavor, vitamins, minerals, and texturizers to a variety of food and non-food products (Woodroof, 1986).

TABLE 3

List of 46 Fruits and 36 of their Commercial Processed Fruit Products

FRUIT	PROCESSED FRUIT PRODUCTS
Apple	Alcoholic Cocktail, Brandy, Cake, Canned, Cereal, Champagne, Chunk, Citric Acid, Confection, Cookie, Crushed, Dried, Essence, Frozen, Glaze, Jelly, Juice, Pectin, Pie, Pie Filling, Puree, Sauce, Snack Bar, Vinegar
Apricot	Brandy, Cake, Canned, Cereal, Chunk, Confection, Cookie, Crushed, Diet Spread, Dried, Frozen, Jam, Nectar, Pie, Pie Filling, Preserves, Puree, Snack Bar, Strained Puree
Avocado	Crushed, Puree
Banana	Cereal, Cookie, Crushed, Dried, Frozen, Puree, Strained Puree
Baobab	Crushed, Pie, Puree
Blackberry	Alcoholic Cocktail, Brandy, Cake, Canned, Cocktail, Cookie, Crushed, Essence, Jam, Jelly, Juice, Nectar, Pie, Pie Filling, Preserves, Puree, Snack Bar, Strained Puree, Syrup, Wine
Boysenberry	Brandy, Cakes, Canned, Cereal, Cocktail, Confections, Cookie, Crushed, Essence, Jam, Jelly, Juice, Nectar, Pie, Pie Filling, Preserves, Strained Puree, Syrup, Wine
Breadfruit	Chunk, Puree
Cherry	Brined, Cake, Canned, Citric Acid, Cocktail, Confections, Cookie, Diet Spread, Frozen, Jam, Jelly, Juice, Nectar, Pie, Pie Filling, Preserves, Puree, Wine
Coconut	Alcoholic Cocktail, Brandy, Cake, Canned, Chunk, Confections, Cookie, Crushed, Dried, Frozen, Juice, Nectar, Pie, Pie Filling, Puree, Snack Bar, Strained Puree, Syrup
Crabapple	Jelly, Pectin, Pickle
Cranberry	Canned, Confections, Crushed, Dried, Glaze, Jam, Jelly, Puree, Sauce, Strained Puree, Syrup

TABLE 3 (cont.)

List of 46 Fruits and 36 of their Commercial Processed Fruit Products

FRUIT	PROCESSED FRUIT PRODUCTS
Currants	Canned, Cookie, Crushed, Diet Spread, Essence, Glaze, Jam, Puree
Elderberry	Alcoholic Cocktail, Brandy, Frozen, Jelly, Juice, Nectar, Puree, Wine
Fig	Cake, Canned, Cereal, Cocktail, Confections, Cookie, Crushed, Diet Spread, Dried, Frozen, Glaze, Nectar, Preserves, Puree, Snack Bar
Gooseberry	Canned, Cocktail, Confections, Jelly, Juice, Preserves, Wine
Grapefruit	Canned, Chunk, Confections, Crushed, Frozen, Glaze, Juice, Marmalade
Grape	Alcoholic Cocktail, Canned, Cereals, Champagne, Cocktail, Crushed, Diet Spread, Jam, Jelly, Juice, Sauce, Snack Bar, Vinegar, Wine
Guava	Crushed, Diet Spread, Jam, Jelly, Leather, Puree, Snack Bar
Honeydew Melon	Confections, Frozen, Glaze
Kiwifruit	Canned, Cocktail, Crushed, Dried
Kumquat	Jam
Lemon	Alcoholic Cocktail, Citric Acid, Crushed, Essence, Frozen, Glaze, Juice, Marmalade, Pectin
Lime	Alcohol Cocktail, Chunk, Crushed, Essence, Frozen, Juice, Marmalade, Pectin
Longan	Citric Acid, Crushed
Loquat	Cocktail, Preserves
Lychee	Canned, Dried
Mango	Crushed, Puree
Nectarine	Canned, Cocktail, Confections, Cookie, Crushed, Diet Spread, Frozen, Jam, Juice, Puree
Olive	Brined

TABLE 3 (cont.)

List of 46 Fruits and 36 of their Commercial Processed Fruit Products

FRUIT	PROCESSED FRUIT PRODUCTS
Orange	Cereal, Champagne, Confections, Cookie, Crushed, Diet Spread, Frozen, Jelly, Marmalade, Wine
Papaya	Crushed, Juice, Leather, Snack Bar, Puree
Sapote	Crushed, Juice, Puree
Passion Fruit	Crushed, Juice, Nectar, Puree
Peach	Brandy, Brined, Cake, Canned, Cereal, Chunk, Cocktail, Confections, Cookie, Crushed, Diet Spread, Dried, Essence, Frozen, Jam, Juice, Leather, Pickle, Pie, Pie Filling, Preserves, Puree, Sauce, Snack Bar, Strained Puree, Syrup, Wine
Pear	Brandy, Canned, Cereal, Chunk, Cocktail, Confections, Cookie, Crushed, Diet Spread, Dried, Frozen
Persimmon	Brandy, Chunk, Crushed, Jam, Juice, Marmalade, Pectin, Pie, Pie Filling, Preserves, Syrup, Wine
Pineapple	Cake, Canned, Cereal, Chunk, Cocktail, Confections, Cookie, Crushed, Diet Spread, Frozen, Glaze, Jam, Juice, Leather, Preserves, Puree, Strained Puree
Plum	Cereal, Cocktail, Confections, Crushed, Diet Spread, Puree, Strained Puree
Pomegranate	Jam, Juice, Leather, Puree, Snack Bar, Strained Puree
Prune	Cake, Canned, Cereal, Cocktail, Confections, Cookie, Crushed, Diet Spread, Dried, Jam, Jelly, Juice, Preserves, Puree, Vinegar, Wine
Quince	Glaze, Jam, Jelly, Juice, Nectar, Pectin, Pickle, Preserves, Puree, Snack Bar, Strained Puree, Wine
Raspberry	Cake, Canned, Cereal, Confections, Cookie, Crushed, Essence, Frozen, Jam, Jelly, Juice, Nectar, Pickle, Pie Filling, Preserves, Snack Bar, Strained Puree, Syrup
Strawberry	Brandy, Cake, Cereal, Confections, Cookie, Crushed, Frozen, Juice, Preserves
Tangerine	Cocktail, Frozen, Glaze, Juice, Puree
Tucuma	Crushed

(Woodroof, and Bor, 1986)

Due to the nature of fruit fillings and toppings, there are variety of market forms available to the foodservice industry for purchase and use. These include: 1) prepared fruit fillings, 2) frozen fruit fillings, and 3) fresh fruit, made into fillings. The containers/packages available to the operator/manager/purchaser include: 1) the #10 can (64 oz. institutional size), 2) plastic pails in a variety of sizes - #2 container (2 gallon), #5 container (5 gallon) and #10 plastic pail (10 gallon), 3) the retail pack #24 can (6-1/2 oz.), and 4) various containers, boxes and bags. A profile of a fruit filling can be found in Table 4 where THANK YOU APPLE PIE FILLING is highlighted (Chilnick, Sonberg & Stern, 1987).

TABLE 4

Profile of Thank You Fruit Filling

Ingredients: Apples, water, corn sweetener, modified food starch, spice flavoring and coloring, salt, calcium lactate, citric acid, erythorbic acid.

Amount: 3 1/2 oz.

			Percentage USDA
Calories	100	Protein	*
Protein, grams	0	Vitamin A	*
Carbohydrates, grams	25	Vitamin C	*
Fat, grams	0	Thiamine	*
Sodium, mil.	15	Riboflavin	*
Cholesterol, mil.	0	Niacin	*
Fiber, grams	2E	Calcium	2
		Iron	*

Contains about 6 teaspoons of sugar.

This Food: About three quarters of the calories in this product are derived from added sugar. Apart from providing some dietary fiber, THANK YOU Apple Pie Filling is not a significant source of nutrients.

Additives: No questionable additives.

Source: Chilnick, Sonberg, and Stern; 1987.

CHAPTER 3

Methodology and Research Design

The previous chapter provided an understanding of the wide variety of foodservice operations available to feed the vast majority of the public. Also examined in the process were factors influencing the purchase decisions and criteria used for the purchase of fruit fillings in the commercial foodservice industry.

The focus of this chapter will be on the methodology employed in conducting the study. The research design consists of essentially three specific areas: 1) the sampling procedure and the administration of the instrument, 2) the construction of the research instrument (questionnaire) and, 3) the identification of the methodology and statistical procedures to be used in the analysis of the resulting data.

Sampling Procedures

Restaurants and Institutions trade magazine was used to obtain a stratified random listing of it's subscription data

base, by state. This subscription list contained two different categories of the foodservice industry: 1) commercial foodservice and, 2) non-commercial foodservice.

The first category, commercial foodservice, includes those foodservice operations that are traditionally associated with non-home foodservice operators. Within this category were five separate types of foodservice operations examined in this study: 1) the deli, 2) fast-food restaurants, 3) full-service restaurants, 4) commercial cafeterias and, 5) lodging facilities. All foodservice operations in this category are open to the public at large.

The second category, non-commercial foodservice is considered to be any foodservice operation that are not open to the public at large, and hence provide an additional service to employees within the organization. Within this category, four different areas of foodservice operations exist: 1) business/industry (contract, in-plant feeding), 2) hospital/nursing home, 3) primary/secondary school and, 4) college/university foodservice.

For this population base, a stratified random sample was selected from the nine foodservice areas identified, resulting in a sample size of 1500 foodservice professionals.

The foodservice professionals from the listing included: 1) assistant managers, 2) general managers, 3) food production managers, 4) dieticians, 5) directors, 6) administrators, 7) purchasers, 8) vice presidents, 9) executive chefs, 10) owners, 11) presidents, 12) multi-unit supervisor, 13) educators, 14) catering managers and, 15) health care administrators.

The survey instrument was distributed to the 1500 foodservice professionals. All fifty states, plus the District of Columbia were represented in the sample. In an attempt to receive a greater response rate, a one dollar bill ($1.00) was placed in the inside of each questionnaire along with a self-addressed return envelope. This strategy was implemented to obtain a greater level of interest in completing the questionnaire. The distribution of the survey instrument is shown in Table 5.

The non-commerical foodservice industry has a tendency to use more fruit filling product than the commercial foodservice industry. The actual weighing of this survey

TABLE 5

Type of Foodservice Operation Sampled

Type of Operation	Number Sampled
Deli	75
Fast Food Restaurant * (a)	75
Full Service Restaurant * (b)	150
Commercial Cafeteria	150
Lodging * (c)	150
Business/Industry (In-plant feeding) * (d)	225
Hospital/Nursing Home	225
Primary/Secondary School	225
College/University	225

* (a) Counter/stand-up/drive-in

* (b) Table/booth

* (c) Drinking place/hotel/motel - 50+ rooms

* (d) Company operated

conforms to the basic distribution of the fruit filling market. The breakdown of foodservice markets sampled and their percentage of the entire sample are listed in table 6.

The non-commercial foodservice industry consists of and is based on overall nutrition and variety for its customers, where there was a higher demand for baked products. Varietal creations of food are important so this product lends itself to that type of creative exploration. However, the commercial foodservice industry's main concern is profit, so creative menus are often sacrificed for a higher profit based on product popularity.

Measurement Instrument

The measurement instrument (questionnaire) consists of several questions relating to the purpose of the study. The questionnaire was created and developed under the guidance of a panel of experts from both industry and education. The first part of the questionnaire contains general questions that examine the demographic aspects of the foodservice industry. These questions seek information about the type of

TABLE 6

Type of Operation Sampled and Percentages of Segment Representation

Type of Operation	Number Sampled	Percentage of Segment Represented
Commercial		
Deli	75	5
Fast-Food Restaurant * (a)	75	5
Full Service Restaurant * (b)	150	10
Commercial Cafeteria	150	10
Lodging * (c)	150	15
Non-Commercial		
Business/Industry * (d)	225	15
Hospital/Nursing Home	225	15
Primary/Secondary School	225	15
College/University	225	15
Totals	1500	100%

* (a) Counter/stand-up/drive-in

* (b) Table/booth

* (c) Drinking place/hotel/motel - 50+ rooms

* (d) Company operated

foodservice operation, the geographic location of the operation (including zip code) and the annual foodservice volume. Obtaining this information aids in gaining a better understanding of the sample studied. The complete questionnaire is found in Appendix C.

The first two questions asked are basic and inquire whether the operation used fruit fillings for anything on the menu and what type of product is used most often. Questions 3 and 4 are related in that they seek to identify the reasons why the operator uses a particular type of filling/topping and specifically what menu items are prepared and sold using the product. Question 5 deals with the usage rates of each operator to discover the volume of the product used and the frequency of use.

Rating the product characteristics of the four different types of fruit fillings, those being: 1) canned, 2) fresh made from scratch, 3) frozen and, 4) plastic pail is one of the central questions in the study. The purpose of this question (question 6) is to gain insight into the operators perceptions of the characteristics of the fruit filling versus the type of packaging. These characteristics include: 1) appearance, 2) consistency of quality, 3) customer appeal, 4) flavor, 5) fruit quality, 6) performance and, 7) texture. This question was important to create an additional

evaluation of specific foodservice operators representing various foodservice markets.

The next question (7a through 7c) was developed to examine brand identification of fruit fillings, inquiring as to which brand was used most often, why it was used and a rating from outstanding to poor to derive attitudes regarding all brands specified. This showed not only the brand loyalty of the operator but showed the characteristics the operators felt to be most important.

Questions 8 and 9 sought to determine the specific reasons why operators chose to use canned or prepared fruit filling. Once again the central issue being the identification of perceptions in quality, whether it be product or service. The second area of these questions dealt with: 1) the response to a higher quality filling on the market, 2) willingness of the operator to pay a higher price for an increased quality and, 3) how much of an increase (in percentage) would the operator be willing to pay for a higher quality filling.

Rating the overall characteristics that influence the purchase decisions to buy fruit fillings and toppings is the second of these central questions presented in this study. These characteristics included: 1) extended shelf life, 2)

improved packaging, 3) variety of flavors, 4) appearance, 5) consistency of product, 6) customer appeal, 7) flavor, 8) fruit quality, 9) performance, 10) texture, 11) improved pricing and, 12) control of waste of unused portion. This question not only addresses the issue of product quality but a whole series of quality related issues ranging from price to packaging to the level of importance of each.

Question 11 was designed to present an example of a specific package design to the foodservice operator for evaluation in the possibility of purchasing the product. This is in reference to a shelf-stable container similar to a half-gallon milk carton with the level of interest being sought. Specifically, (11a - 11d) inquired about the following: 1) would the operator purchase product in this container, 2) if product was resealable in original container for storage of unused portion, 3) would operator purchase product if available in a variety of flavors in one case and, 4) would operator pay a higher price for this package.

The last question (question 12) focused on a series of packaging criteria when purchasing food products for the foodservice operation presented previously. This question was designed to evaluate the attitudes of the operators/purchasers perspectives and the role that packaging of food products plays on the purchasing function, based on

the level of importance. Question 12 deals specifically with the package/container's ability to: 1) control waste of product, 2) efficiently use storage space, 3) ease of opening, 4) ease of dispersion,
5) resealability, 6) correct portion size, 7) acceptable cost, 8) extended shelf life, 9) inventory control, 10) ease of disposal, 11) preservation of nutrition and, 12) preparation and storage information available. This is the third central research question in the study.

Methodology of Analysis

Several statistical analyses will be performed on the resultant data collected. First, a descriptive listing of the demographic items in the instrument was performed. The Condescriptive program of the Statistical Package for the Social Sciences (SPSS) was employed (Nie, Hull, Jenkins, and Steinbrenner, 1975). This program lists frequencies, means and standard deviations of the input data and was performed on the Rochester Institute of Technology's VAX computer system.

Second, a two-way analysis of variance was administered on the perceptive rating of the characteristic of fruit fillings versus the types of packaging. This too was implemented by the SPSS (Statistical Package for the Social

Sciences) (NIE, HULL, JENKINS, AND STEINBRENNER, 1975) and computed on the VAX computer system at the Rochester Institute of Technology.

CHAPTER IV

Findings and Analysis

In the preceding chapter the research design was presented and the methodology was discussed. In this chapter the findings will be addressed. The presentation of the findings will center upon several statistical methods. First, descriptive statistics of the population of foodservice professionals will be presented. Second, a two way variance of analysis will be performed on the perceptive rating of the characteristics of fruit fillings versus the types of container/packaging design.

Descriptive Statistics of the Sample

Of the 1500 questionnaires mailed, 39 were returned by the postal service for either a wrong address or the business had moved. Of those, 32 were from the deli, fast food or full service restaurant foodservice segments. Additionally, seven surveys were not used because they were not sufficiently completed to be included in the analysis. The return of 582 useable surveys represent a return rate of 40.02% (582/1454). Table 7 shows the frequency distribution of the sample responses categorized by the type of foodservice operation. Given the weighted nature of the sample (see Table 6) it is not surprising that

TABLE 7

Survey Returns by Type of Operation

Type of Operation	Surveys Sent	Surveys Returned	Percentage Returned	Percentage of Total Returns
Commercial	(600)	(189)	---	(32.9)
Deli	75	7	9.3	1.3
Restaurant (Fast Food)	75	42	56.0	7.3
Restaurant (Full Service)	150	61	40.6	10.6
Commercial Cafeteria	150	41	27.3	7.1
Lodging	150	38	25.3	6.6
Non-Commercial	(900)	(386)	---	(67.1)
Business/Industry	225	70	31.1	12.2
Hospital/Nursing Home	225	112	49.7	19.5
Primary/Secondary School	225	102	49.7	17.7
College/University	225	102	45.3	17.7
TOTAL	1500	582	34.8	100.0
TOTAL VALID	1454	582	40.02	

the majority of the respondents (67.1%) were from the non-commercial foodservice segment. . . that is hospitals/nursing homes (19.5%), primary/secondary schools (17.7%), colleges/universities (17.7%), and business/industry foodservice (12.2%). Hence, with the large sampling of the non-commercial food industry, it is also not a surprise that 64.5% of the foodservice operations responding had an annual sales volume of under $1 million dollars (see Table 8).

Further, in reference to the geographical breakdown of questionnaire distribution (see Table 9), it clearly shows the statistical dominance of the Northeast and Midwestern regions.

The largest percentage (86.1%) of the respondents stated that they use fruit fillings or toppings in some way, shape or form in their foodservice operations (see Table 10). This shows that this particular food product is widely used in the foodservice segments sampled so the response data will be an overall view of the product usage and consumer attitudes.

Canned or prepared fruit fillings/toppings were the most popular with a 49.8% usage rate, 18.0% preferred frozen, 16.7% preferred fresh from scratch, 12.0% plastic pail fruit fillings and, 3.5% preferred other forms. Some of the other forms preferred included: government commodity, diet fruit

TABLE 8

Survey Returns by Annual Foodservice Volume

Volume of Operation	Respondents	Percentage of Total
100K - 499K	224	41.2
500K - 999K	127	23.3
1000K - 1999K	77	14.2
2000K - 2999K	38	7.0
3000K - 3999K	20	3.7
4000K - 4999K	18	3.3
5000K - 5999K	19	3.5
Over 6000K	21	3.9
TOTAL	544	

TABLE 9

Sampling by Geographic Area

Type of Operation	Northeast	Midwest	Southwest	Southeast	Northwest	Total
Hospital/Nursing Home	61	76	38	38	12	225
College/University	59	78	42	32	14	225
Primary/Secondary School	62	78	32	37	16	225
Business/Industry Foodservice	75	73	40	36	1	225
Full Service Restaurant	36	40	36	29	9	150
Fast Food Restaurant	12	20	23	17	6	75
Commercial Cafeteria	22	35	43	42	8	150
Lodging Foodservice	31	35	37	36	11	150
Deli	11	20	22	17	2	75

TABLE 10

Percentage of Respondents that use Fruit Filling on Menu

Yes	86.1
No	13.9

filling, powder mix (insta-pak) and government donated (see Table 11). The majority (54.3%) used the filling or topping in question 2 because of the perceived convenience in use (see Table 12). 35.3% for quality of product, 31.5% consistency of product, 25.3% for cost, 15.7% for packaged shelf life and 7.7% for product life after opening. Still, 6.4% had other reasons as to why the category of fillings were purchased. These included: commissary for company carrying the product, year round availability, aesthetics and image, and finally, the product being approved for use (see Table 13).

The usage of fillings/toppings for particular menu items had the category of cheesecake bringing the highest percentage used at 47.3% (see Table 14), cobblers at 42.8%, pies at 42.4%, cakes at 31.7%, tarts at 29.0%, toppings for ice cream at 23.7%, sauces at 21.0%, 18.8% for glazes, 15.5% for danish and 7.5% for doughnuts. Also, 12.2% stated other menu items as a consideration for purchasing fruit fillings. These included and are not limited to: crepes, muffins, turnovers, milkshakes, salads, croissants, biscuits, puddings, pancakes, jello, cookies, french toast, sweet rolls, etc. (see Table 15).

It comes as no surprise that the usage in purchasers of fruit fillings/toppings as noted at 45.5% in the "Less Than 3

TABLE 11

Type of Filling/Topping Used Most Often

Type of Filling/Topping	Usage Percentage
Canned	49.8
Frozen	18.0
Fresh From Scratch	16.7
Plastic Pail	12.0
Other	3.5

TABLE 12

Reasons for Filling/Topping Use

Product Attributes	Usage Percentage
Convenience in Use	54.4
Quality of Product	35.3
Consistency of Product	31.5
Cost	25.4
Shelf Life - Packaged	15.7
Product Life - Opened	7.7
Other	6.4

TABLE 13

Other Attributes Cited for Using Particular Types of Fruit Fillings/Toppings

Attribute	Frequency
Commissary Carries Product	2
Aesthetics & Image	1
Approved Product	3
All Year Availability	2

TABLE 14

Menu Items Made with Filling/Topping

Menu Item	Usage Percentage
Cheesecake	47.3
Cobbler	42.8
Pie	42.4
Cake	31.7
Tart	29.0
Ice Cream	23.7
Sauce	21.0
Glaze	18.8
Danish	15.5
Other	12.2
Doughnut	7.5

TABLE 15

Other Items Cited by Respondents for Using Fruit Fillings/Toppings

Items or Process	Frequency
Crepes	1
Yogurt	2
Waffles	9
Blintzes	1
Pancakes	9
French Toast	1
Turnovers	4
Pudding	1
Jello	4
Milk Shakes	2
Cookies	1
Mousse	1
As a Garnish	1
Salads	1
Sauce for Pork	1
Croissants	1
Short Cakes	1
Kolaches	1
Sweet Roll	1
Crisps	2
Eclairs	1
Biscuits	1
TOTAL	47

#10 cans" category with the majority of foodservice sales being under $1 million (see Table 16). In the categories of "4 - 6 #10 cans", "7 - 12 #10 cans", and "13 or more #10 cans" results were 23.0%, 16.6%, and 14.9% respectively.

The first central research question highlights obvious differences in the attributes of fruit fillings/toppings. These attributes include: 1) appearance, 2) consistency of quality, 3) customer appeal, 4) flavor, 5) fruit quality, 6) performance, and 7) texture (see Table 17).

In the appearance category, with a rating of very good or outstanding, 71.6% stated fresh was the best, 51.7% chose frozen, 46.7% preferred canned and 42.5% thought that plastic pail was the highest in appearance. Consistency of quality showed canned being most popular at 58.3%, frozen at 51.7%, fresh at 46.3% and plastic pail at 44.4%.

Perceptions or customer appeal showed a glaring distinction between the type of filling categories. 76.0% stated high satisfaction with fresh, 46.6% liked frozen, 41.2% preferred canned, and 37.0% leaned toward plastic pail. Flavor research indicated 75.3% preferred fresh, 44.0% liked frozen, 37.8% purchased plastic pail, and 37.2% bought canned. Once again, fresh from scratch was the most popular

TABLE 16

Volume of Filling/Topping Used Per Week

Volume of Filling/Topping Used	Usage Percentage
Up to 9 Quarts (3 #10 cans)	45.5
12 - 18 Quarts (4 - 6 #10 cans)	23.0
21 - 36 Quarts (7 - 12 #10 cans)	16.6
39 Quarts or More (13 or more #10 cans)	14.9

TABLE 17

Sample Returns with a Rating of Very Good or Outstanding of Characteristics of Types of Fruit Filling/Topping

	TYPE OF FRUIT FILLING/TOPPING			
ATTRIBUTE	Canned Percentage	Fresh, From Scratch Percentage	Frozen Percentage	Plastic Pail Percentage
Appearance	46.7	71.6	51.7	42.5
Consistency of Quality	58.3	46.3	51.7	44.4
Customer Appeal	41.2	76.0	46.6	37.0
Flavor	37.2	75.3	44.0	37.8
Fruit Quality	33.2	67.2	41.3	35.5
Performance	22.6	53.1	34.6	37.8
Texture	38.5	62.9	38.4	34.3
TOTAL AVERAGE	39.7	64.6	44.0	38.5

by a wide margin.

Distribution of responses was across the fruit quality category indicates that 67.2% of responses went with fresh, 41.3% preferred frozen, 35.5% bought plastic pail, and 33.2% purchased plastic pail. The wide margin between type of fillings seem to be prevalent over the previous two categories.

In the performance category respondents chose fresh from scratch as the best (53.1%) and canned as the least desirable (22.6%). Plastic pail fillings was second at 37.8% and frozen at 34.6%.

The final category for this question deals with the issue of texture and its relation with the types of fruit filling studied. Fresh from scratch was first at 62.9%, canned at 38.5%, frozen at 38.4% and plastic pail at 34.3%.

Based on the results of this question, the trend indicates that fresh from scratch is the best product of the four types included. Final total averages were as follows: 1) fresh 64.6%, 2) frozen 44.0%, canned 39.7%, and 4) plastic pail 38.5%.

To obtain the specifics of what manufacturers brand of

filling/topping was used most often, question 7a was posed to the foodservice professionals. Sysco prevailed as the most single used filling from the population sample studied at 22.7%; with Lawrence used the least at 1.5%. Perspectively from highest to lowest were Kraft - 9.1%, Globe and Nugget - 8.0%, Comstock - 5.8%, Code - 5.6%, Thank You - 4.3%, Lucky Leaf - 3.9%, White House - 2.8%, and Wilderness - 2.2% (see Table 18). The "other" category of this question received a 26.1% percentage rating which shows many other types of brands used in this particular food market. These include and are not limited to: Calbortrol, Synders, Monarch, Rick's, R & H, Sexton, Karps, Nopak, Libby's, Pennant, Boyd's and many more (see Table 19).

Question 7b addresses the reasons behind the operators purchase of these particular manufacturer's brands of fillings/toppings. The reason most cited was good service - 29.7%, good reputation - 27.7%, best product quality - 24.2%, providing a variety of flavors 18.8%, a well known name - 15.0%, a perceived leadership role in the industry 6.1% and bakery expertise - 5.2%. Other reasons cited by the respondents were: contracts with particular purveyors, cost, quality, approved vendor, prime vendor, bid, price, franchise agreements and warehouse carries product needed (see Table 20).

TABLE 18

Brand of Filling/Topping Used Most Often

Product Brand	Usage Percentage
Sysco	22.7
Kraft	9.1
Globe	8.0
Nugget	8.0
Comstock	5.8
Code	5.6
Thank You	4.3
Lucky Leaf	3.9
White House	2.8
Wilderness	2.2
Lawrence	1.5
Other	26.1

TABLE 19

Other Manufacturers Brands of Fruit Fillings/Toppings Used by the Sample

Manufacturers Brand	Frequency
Carobotrol	2
Government Commodity	4
Rust Co.	1
Ampco Brill	1
Snyders	2
B & R	1
Monarch	9
Rich's	1
Dickenson's	1
Westco	2
White Swan	2
R & H	2
Sexton	8
Margate	1
Karp's	9
FSW	1
Nifda	6
Henry & Henry	4
Norpak	1
Simon	1

TABLE 19 (cont.)

Other Manufacturers Brands of Fruit Fillings/Toppings Used by the Sample

Manufacturers Brand	Frequency
Libby's	1
Naturipe	1
Dairy Queen	1
USDA	5
Boyd's	1
Rhinehart	1
Sandler	1
Pleezing	1
Wicks	1
Sonic Label	1
All Kitchen	1
PYA	1
NLRA	1
Carma/Albert Lister	1
Howard House	1
Lucky Boy	1
Embassy	1
Sugar Hill	1
Dunkin	1
Lucks	1

TABLE 19 (cont.)

Other Manufacturers Brands of Fruit Fillings/Toppings Used by the Sample

Manufacturers Brand	Frequency
Keith's	1
Autocrat	1
Ser	1
Commisary	2
North American	3
Golden Age	2
Dawn/Brecht/Apehter	1
RTS	1
Edwards-Christopher	1
H & H	1
Lyons	1
Frosty Acres	1
Government Surplus	1
Delmonte	1
Willmark	1
Rykoff	3
Smuckers	3
Dole	2
Davis	1
Gordons Foods	1

TABLE 19 (cont.)

Other Manufacturers Brands of Fruit Fillings/Toppings Used by the Sample

Manufacturers Brand	Frequency
C.P.	1
FFM	1
EFCO	1
IJ Label	1
Cherry Central Inc.	1
Red & White	2
Pennant	1
TOTAL FREQUENCY	121
TOTAL OTHER BRANDS	68

TABLE 20

Reasons for Brand Usage

Reason for Use	Usage Percentage
Good Service	29.7
Good Reputation	27.7
Best Product Quality	24.2
Variety of Flavors	18.8
Well Known Name	15.0
Good Package Options	7.5
Leader in Industry	6.1
Bakery Expertise	5.2
Other	27.1

The third part of this question asks the foodservice professional to rate the stated brands of filling in the initial section of the question. The results were as follows: Kraft - 52.1%, Sysco - 39.7%, Comstock - 30.2%, Lucky Leaf - 25.7%, Thank You - 24.0%, Nugget - 22.7%, Globe - 21.2%, Wilderness - 20.2%, White House - 15.4%, Code - 15.1% and Lawrence - 10.3%. The "other" category represented 73.5% which is not representative of the question as it relates to several different brands for stated reasons in the previous part of the question (see Table 21). As is well stated, Kraft was the highest with the rating of this question as compared to the other brands.

Some of the problems with canned or prepared fruit fillings/toppings are evaluated in question 8. Operators were asked why they chose not to purchase canned fruit fillings (see Table 22). The results were as follows: 1) can't use enough to justify purchase and inventory - 10.1%, 2) cost is too high - 8.7%, 3) poor quality - 5.6%, 4) uses other types of product - 5.2%, 5) high waste cost of unused portion - 4.0%, 6) difficult to store - 2.3%, and 7) difficult to use - 0.7%. The "other" category of the question represented 8.9% but had no explanation to specify the evaluation.

The need for a higher quality fruit filling/topping is

identified in question 9. This question is stated in three parts relating quality of prepared or canned fillings to the level of interest in purchasing. Part "a" results are as follows: 27.9% were very or extremely interested in buying, 26.8% were not very interested or not at all interested and 45.3% were somewhat interested (see Table 23). The second part of this question asks the level of interest in paying a higher price for the product stated above. The results were as follows: 8.7% were very or extremely interested, 55.2% were not very or not at all interested, and 36.1% were somewhat interested (refer to Table 24).

The third part to the above question asks specifically how much more the operator would be willing to pay for the higher quality product. The results were as follows: 75.9% would pay (10%) more, 15.1% would pay (15%) more, 7.1% would pay (20%) more, 0.9% would pay (25%) more, and 1.1 would pay (30%) more (refer to Table 25).

Focusing on the second central research question will be the next phase of statistics of this circumstance. This area will indicate the influences that product and package design have on the overall criteria for packaging fruit fillings and toppings. The question asks the food service professional to rate the following characteristics based on the level of importance of each. Results were as follows based on a

TABLE 21

Rating of Manufacturers Brands of Fruit Fillings/Toppings with a Response of Very Good or Outstanding

Brand	Percentage
Code	15.1
Comstock	30.2
Globe	21.2
Kraft	52.1
Lawrence	10.3
Lucky Leaf	25.7
Nugget	22.7
Sysco	39.7
Thank You	24.0
White House	15.4
Wilderness	20.2

* Other Represented 73.5%

TABLE 22

Factors Determining Why Canned or Prepared Fillings/Toppings Are Not Used

Usage Factors	Usage Percentage
Can't Use Enough	10.1
Cost is Too High	8.7
Poor Quality	5.6
Use Other Types of Fillings/Toppings	5.2
High Waste of Unused Product	4.0
Difficult to Store	2.3
Difficult to Use	1.7
Other	8.9

TABLE 23

Level of Interest in Respondents to Purchase a Higher Quality Fruit Filling/Topping

Level of Interest	Percentage
Very/Extremely	27.9%
Somewhat	26.8%
Not Very/Not at All	45.3%

TABLE 24

Level of Interest in Paying a Higher Price for a Higher Quality Fruit Filling/Topping

Level of Interest	Percentage
Very/Extremely	8.7%
Somewhat	36.1%
Not Very/Not at All	55.2%

TABLE 25

Willingness of Respondents to Pay 10 - 30% More for a Higher Quality Canned Fruit Filling/Topping

Increase in Price (in Percentage)	Respondents (in Percentage)
10	75.9
15	15.1
20	7.1
25	0.9
30	1.1

rating of very or extremely important: 1) extended shelf life (52.1%), 2) improved packaging options (31.3%), 3) providing a variety of flavors in one case (68.6%), 4) appearance (81.2%), 5) consistency of quality (86.8%), 6) customer appeal (83.4%), 7) flavor (88.1%), 8) fruit quality (85.8%), 9) performance (78.6%), 10) texture (77.1%), 11) improved pricing structure (63.2)%, 12) control waste of unused portion (72.2)%. In summary the most influential characteristic is flavor (88.1%), and the best least important was improved packaging options - 31.9% (see Table 26 for percentages in their entirety).

Question 11 displays a hypothetical situation for the use of a specific package design. The purpose is to explore the attitudes of potential foodservice operations in buying fruit fillings/toppings in this particular package. By exploring these attitudes, it will give the reader a good background for the final central research question. The results were as follows: 1) would purchase if fillings were available in the container: 33.6% - very or extremely interested, 40.7% - somewhat interested, 25.7 - not very or not at all interested. 2) Easily reseal unused portion in this container: 66.1% - very or extremely interested, 20.9% - somewhat interested, 12.1% - not very or not at all interested 3) A variety of flavors were available in one case pack: 49.7% - very or extremely interested, 25.0% -

TABLE 26

Survey Returns Categorizing Product Attributes with a Rating of Very or Extremely Important

Attribute of Product	Surveys Returned	Percentage Returned
Extended Shelf Life	259	52.1
Improved Packaging Options	151	31.1
Variety of Flavors in One Case	193	38.7
Appearance	415	81.2
Consistency of Quality	441	86.8
Customer Appeal	423	83.4
Flavor	451	88.1
Fruit Quality	442	85.8
Performance	394	78.6
Texture	388	77.1
Improved Pricing Structure	310	63.1
Control Waste of Unused Portion	366	72.2

somewhat interested, 25.3% - not very or not at all interested 4) Pay a higher price for these characteristics: 11.8% - very or extremely interested, 39.7% - somewhat interested, 48.4% - not very or not at all interested in paying a higher price. (See Table 27 for detailed percentages of question).

Finally, the third central research question was examined. This area focuses on the influence that the packaging qualities have on the criteria of purchasing in a foodservice operation. It is important to state that this question deals with specific functions the package creates or controls. It is much broader to encompass the purchasing of all food, not just fruit filling/toppings. Attitudes are studied to determine the level of importance certain package/container functions have on the buyers decision to purchase. The results listed in Table 28 are as followed based on a rating of very or extremely important: 1) control waste of product (78.5%), 2) efficiency in storage (68.1%), 3) convenience in opening (45.4%), 4) convenience in dispersing (48.7%), 5) convenience in resealing (55.5%), 6) portion size (56.8%), 7) cost (81.7%), 8) extended shelf life (65.47%), 9) inventory control (61.8%), 10) disposing of container/package waste (37.9%), 11) preserving nutrition (63.5%), and 12) storage and preparation information (50.8%).

TABLE 27

Levels of Interest in Purchasing Fruit Fillings in 1/2 Gallon Shelf-Stable Milk Carton Containers by Respondents Sampled

	LEVEL OF INTEREST (in Percentage)				
Variable	Extremely	Very	Somewhat	Not Very	Not at All
Wouldn't Purchase if Available in this Container	7.3	26.3	40.7	16.7	9.0
TOTAL	33.6		40.7	25.7	
Easily Reseal the Unused Portion in the Original Container for Storage	19.7	45.4	20.9	5.9	6.2
TOTAL	66.1		20.9	2.1	

TABLE 27 (cont.)

Levels of Interest in Purchasing Fruit Fillings in 1/2 Gallon Shelf-Stable Milk Carton Containers by Respondents Sampled

	LEVEL OF INTEREST (in Percentage)				
Variable	Extremely	Very	Somewhat	Not Very	Not at All
A Variety of Flavors Available in One Case Pak	19.4	30.3	25.0	13.6	11.7
TOTAL	49.7		25.0	25.3	
Pay a Higher Price for these Conveniences	.9	10.9	39.8	29.6	18.8
TOTAL	11.8		39.8	48.4	

TABLE 28

Level of Importance in Rating Package/Container Qualities in Evaluating Purchasing Criteria with a Rating of Very or Extremely Important

Package/Container Quality	Response (In Percentages)
Control Waste of Product	78.5
Efficiency in Storage Space	68.1
Convenience in Opening	45.4
Convenience in Dispensing	48.7
Convenience in Resealing	55.5
Portion Size	56.8
Cost	81.7
Extended Shelf Life	65.4
Inventory Control	61.8
Disposing of Container/Package Waste	37.9
Preserving Nutrition	63.5
Storage and Preparation Information	50.8

* Other Represented 76.9%

The "other" category represented 76.9% responding extremely important for a variety of reasons, which were not indicated. The assumption in this question is that the respondents were very opinionated and possibly checked off extremely important because it was the last question. Hence, this category indicates little relevance to the study.

The presentation of findings, thus far, has consisted of addressing the descriptive statistics of each of the variables individually. A two-way analysis of variance are studied on the initial research question.

Two-Way Analysis of Variance

A two-way analysis of variance was performed on the first central research question. This question identifies the differences in the types of fruit fillings: fresh, frozen, plastic pail and canned in relation to the seven (7) attributes presented to the foodservice professionals. These included: appearance, consistency of quality, customer appeal, flavor, fruit quality, performance and texture. The following scale was used to determine the attitudes of the respondents by the mean:

1	2	3	4	5
Outstanding	Very Good	Good	Fair	Poor

Based on this scale, the results were as follows for appearance: fresh from scratch (2.09), frozen (2.63), canned (2.38), frozen (2.53), fresh from scratch (2.59), and plastic pail (2.62). The customer appeal attributes were noted as the following: fresh (2.00), frozen (2.61), canned (2.73), and plastic pail (2.76).

These fruit fillings/toppings were rated by their flavor as followed: fresh (1.95), frozen (2.63), canned (2.61), and plastic pail (2.76).

Fruit quality was rated as: fresh (2.18), frozen (2.67), plastic pail (2.82), and canned fruit fillings (2.85).

The performance was rated as: fresh (2.18), frozen (2.67), plastic pail (2.82), canned (2.61), frozen (2.71) and plastic pail (2.72).

Finally, texture is the last attribute standard. Fresh was the highest with a rating of (2.25), canned (2.73), frozen (2.81) and the lowest being plastic pail (2.83).

A summary of this analysis can be found in Table 29. The overall results are as follows: fresh (2.21), frozen (2.64), canned (2.65), and plastic pail (2.73).

In this chapter, the findings of the measurement instrument (questionnaire) are presented. The findings arranged in a progressive manner, first giving the descriptive statistics. Second, a two way analysis was conducted on the first central research question determining the quality attributes of specified forms of fruit fillings in this study.

TABLE 29

A Two-way analysis of variance of the attributes of fresh, made-from-scratch, frozen, plastic, and canned fruit fillings used by foodservice professionals.

Attribute	Canned	Fresh	Frozen	Plastic Pail
Appearance	2.53	2.09	2.52	2.64
Consistency of Quality	2.38	2.59	2.53	2.62
Customer Appeal	2.69	2.00	2.61	2.75
Flavor	2.73	1.95	2.63	2.76
Fruit Quality	2.85	2.18	2.67	2.82
Performance	2.61	2.43	2.71	2.72
Texture	2.73	2.25	2.81	2.83
Total	2.65	2.21	2.64	2.73

The next chapter, Chapter V, will summarize the findings of this study and draw inferences that relate to the central questions identified in Chapter I. Recommendations for further study will also be offered.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

It was the goal of this research to assess the role of packaging in the commercial foodservice industry in relation to the purchasing criteria of the foodservice operator. This study on packaging relates to food products typically used in commercial foodservice establishments. Specifically, the role of packaging on fruit fillings was examined. This process of examination was viewed through the aspect of existing food paks for the fruit filling market as well as a potential pak for study.

Even though fruit fillings were the major concern for study, implications in the overall food market-packaging relationship were established. Briefly, there was a substantial mix of other food items for inquiry. A questionnaire was developed that included both general questions about the food packaging relationship and specifically more targeted statements of fruit fillings. A perception rating of fruit fillings was developed to identify the attitudes of foodservice operators towards the characteristics of the following types of fruit fillings:

canned; fresh, from scratch, frozen, and plastic pail. These attributes included appearance, consistency of quality, customer appeal, flavor, fruit quality, performance and texture. These attitudes were evaluated with responses of outstanding, very good, good, fair and poor. The measurement instrument was administered to a national sampling of foodservice professionals. The data was analyzed using several types of statistical methods. A two way analysis of variance was performed to identify the rating characteristics of the types of fruit fillings specified. Descriptive statistics were performed on all variables of data to identify perceptions of the packaging of fruit fillings, product characteristics and broad identifications and usage methods.

The examination of the perceptions of foodservice professionals must be viewed from the concept of a variety of motivational characteristics indicative of the market segment they represent. This is especially true with the nine different foodservice markets targeted and that the questionnaires were mailed to a national sampling of the population.

CONCLUSION

The conclusions which may be drawn from reflecting on the research questions addressed in the study are as follows. The first central statement identified:

1. A perceptive rating of the characteristics of fruit fillings versus types of packaging that being canned, fresh, frozen and plastic pail fruit fillings.

The descriptive statistics identified the foodservice professional's attitudes on the specific attributes of fruit fillings/toppings. Out of a perceptive rating as stated in the summary, fresh-made from scratch fillings were the highest rated on the scale of attributes presented.

The two way analysis of variance reinforced all the results of the fresh fruit fillings being the most popular by all the attributes (appearance, customer appeal, flavor, fruit quality, performance and texture). The only attribute that failed the fresh category was consistency in quality which proved to rate 3rd out of the four product areas. While all the indications point to a desire for a fresh quality product, perceptions are extremely low on the consistency of the fresh product.

The second central question asked:

2. What factors influence the purchasing of the various types of package design?

The flavor attributes proved to be the highest priority among the foodservice professionals, stating the essence of quality product. These perceptions could be interpreted from the point of view in terms of either the customer or foodservice operator. Consistency of quality, customer appeal and fresh quality respectively, ranked on being important attitudes in addition to flavor. All of these attributes are product-related reinforcing a perception of product superiority as being the key for customer satisfaction and usage.

The third central question asked was:

3. What criteria in terms of ranking importance do various packaging/container qualities have on the purchase decision?

The overriding results of this question indicate the most important attribute for the consideration of the foodservice professional in terms of packaging is cost. This falls in line with the perceptions and realities involving

the expenses relating to operations in the foodservice industry, where cost control is all important. Controlling waste of product, storage efficiency, inventory control and extended shelf life. All stress concern of stretching financial considerations towards cost efficiency. It is not surprising that the majority of areas of concern are financially related as opposed to product/service usage.

Recommendations for Further Study

On the basis of the research completed for this thesis, the following recommendations for further study are made:

1. Administration of this survey instrument to a different population. The survey would have to be restructured but this instrument should be tested to other professionals in the food industry such as distributors, marketers, manufacturers, and food analysts. All of these would reflect a vast difference of perceptions of the issues specified.

2. Administration of the survey instrument to individuals who have graduated from foodservice curriculums of a BOCES program, two-year community or junior college or a four year college or university. This would reflect in attitudes and behavior.

3. The development of the measuring instrument for detailed study on the packaging of food containers and the cost/benefit in respect to recycling. This would determine the level of priority waste management has in the food industry.

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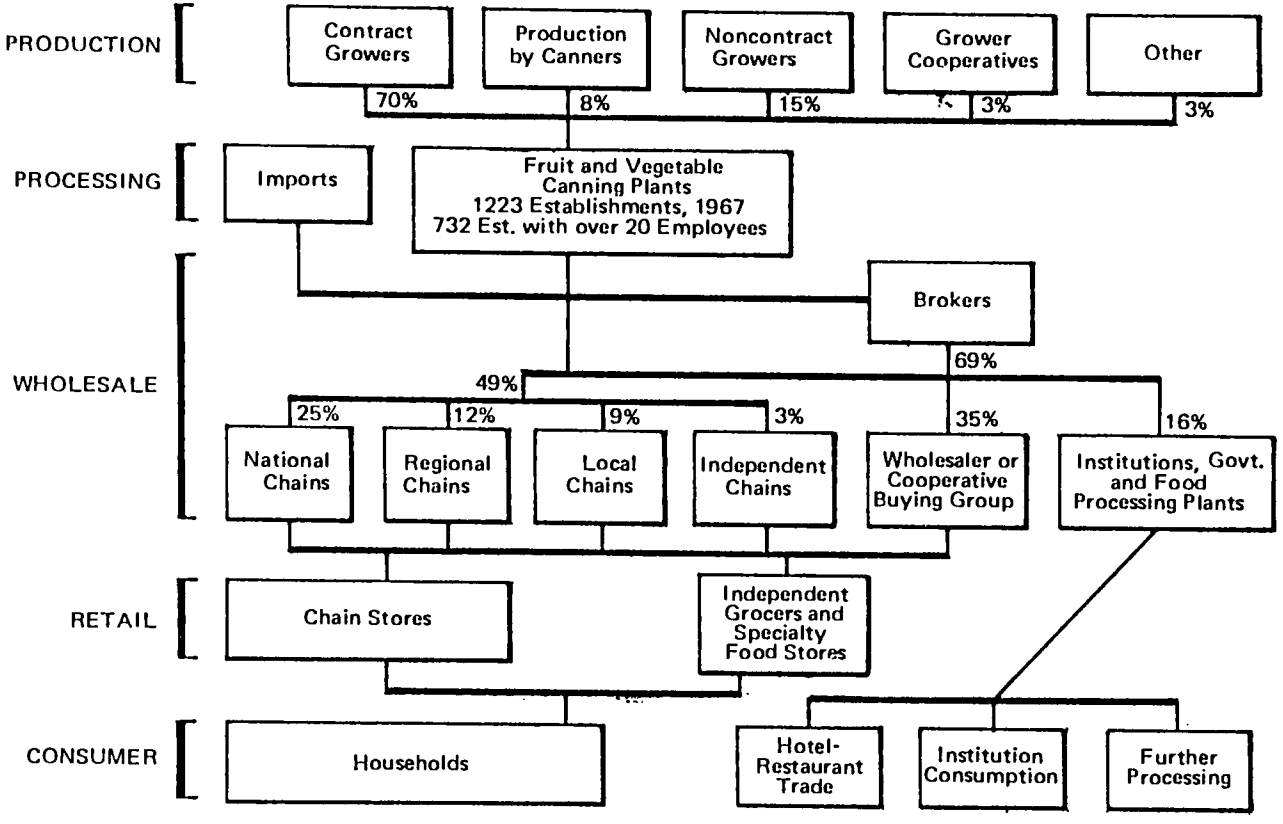
APPENDIX A

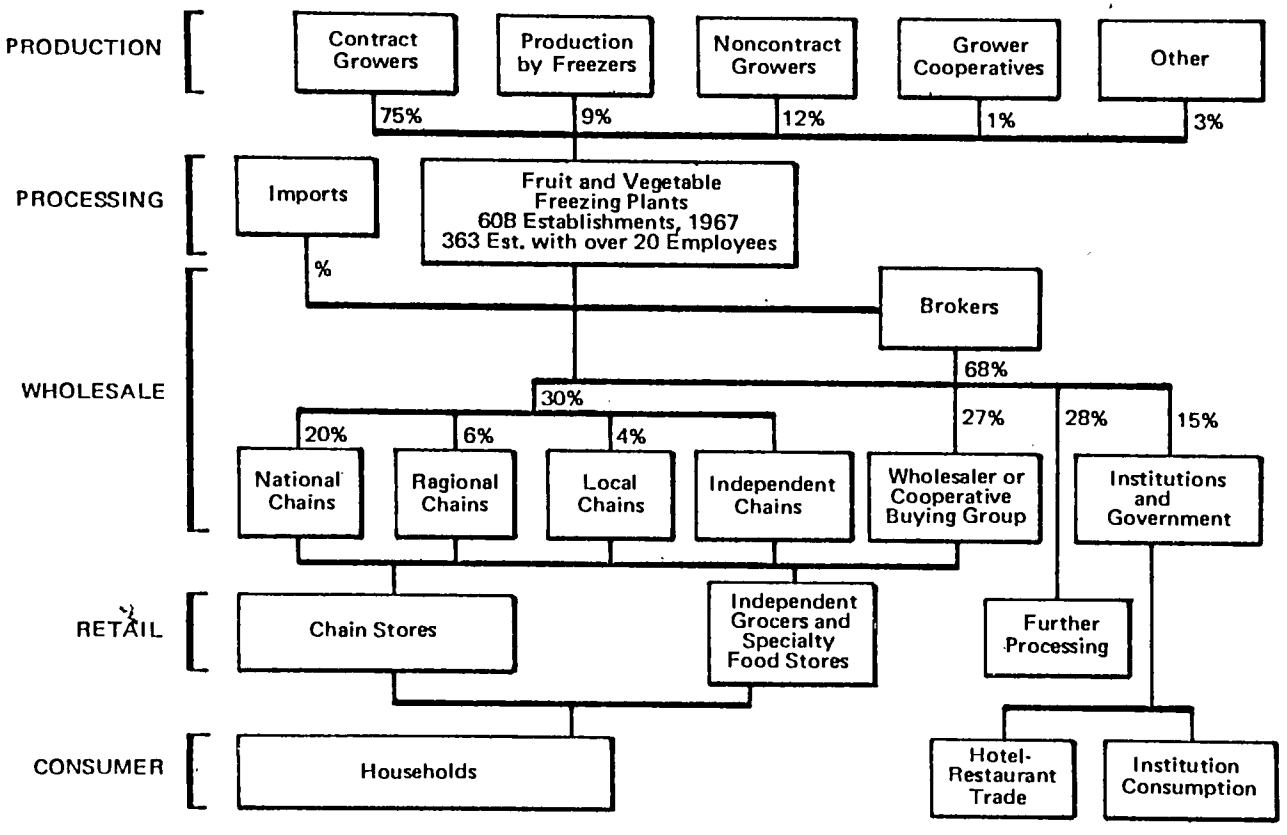
PRODUCT FLOW OF CANNED FRUITS AND VEGETABLES IN THE UNITED STATES



Source: National Commission of Food Marketing

APPENDIX B

PRODUCT FLOW OF FROZEN FRUITS AND VEGETABLES IN THE UNITED STATES



Source: National Commission of Food Marketing

APPENDIX C

Rochester Institute of Technology

School of Food, Hotel & Tourism Management

November 17, 1989

Dear Foodservice Operator:

Thank you for taking time out of your busy schedule to focus on this matter. I am a graduate student working on completing my Master's thesis in the School of Food, Hotel & Tourism Management at the Rochester Institute of Technology in Rochester, New York.

My thesis addresses the issue of food packaging and its relation to the foodservice operator with fruit fillings and toppings as its primary focus.

Enclosed is a $1.00 bill for you to enjoy a hot cup of coffee or a cold beverage while taking a few minutes to complete the enclosed questionnaire. Please return the questionnaire by December 15, 1989. A postage paid envelope is enclosed for your convenience.

All specific information collected through this survey will be held in the strictest of confidence. An executive summary will be available to all survey respondents upon request. Please submit a business card upon reply if you desire a copy of the summary.

If you have any questions regarding the survey itself or the intent of this research, please contact me or the project coordinator, Dr. Richard Marecki at (716) 475-5666.

Thank you for your time.

Sincerely,

Damon A. Revelas

Damon A. Revelas
Masters Candidate

Richard F. Marecki

Richard F. Marecki, Ph.D.
Chairman, Department of
Graduate Studies

Enc.

Type of Operation: (Please Check)

a) _____ Fast Food Restaurant b) _____ Full Service Restaurant c) _____ Commercial Cafeteria
d) _____ Lodging e) _____ Business/Industry f) _____ Hospital/Nursing Home
g) _____ Primary/Secondary School h) _____ College/University i) _____ Deli

City _____ State _____ Zip _____

Annual Foodservice Volume: (Check One)

a) _____ $100,000 - 499,999 b) _____ $500,000 - 999,999 c) _____ $1,000,000 - 1,999,999
d) _____ $2,000,000 - 2,999,999 e) _____ $3,000,000 - 3,999,999 f) _____ $4,000,000 - 4,999,999
g) _____ $5,000,000 - 5,999,999 h) _____ Over $6 Million

- - - -

	Out Standing	Very Good	Good	Fair	Poor
FRESH - MADE FROM SCRATCH					
a) Appearance	( )	( )	( )	( )	( )
b) Consistency of Quality	( )	( )	( )	( )	( )
c) Customer Appeal	( )	( )	( )	( )	( )
d) Flavor	( )	( )	( )	( )	( )
e) Fruit Quality	( )	( )	( )	( )	( )
f) Performance	( )	( )	( )	( )	( )
g) Texture	( )	( )	( )	( )	( )

	Out Standing	Very Good	Good	Fair	Poor
FROZEN					
a) Appearance	( )	( )	( )	( )	( )
b) Consistency of Quality	( )	( )	( )	( )	( )
c) Customer Appeal	( )	( )	( )	( )	( )
d) Flavor	( )	( )	( )	( )	( )
e) Fruit Quality	( )	( )	( )	( )	( )
f) Performance	( )	( )	( )	( )	( )
g) Texture	( )	( )	( )	( )	( )

	Out Standing	Very Good	Good	Fair	Poor
PLASTIC PAILS					
a) Appearance	( )	( )	( )	( )	( )
b) Consistency of Quality	( )	( )	( )	( )	( )
c) Customer Appeal	( )	( )	( )	( )	( )
d) Flavor	( )	( )	( )	( )	( )
e) Fruit Quality	( )	( )	( )	( )	( )
f) Performance	( )	( )	( )	( )	( )
g) Texture	( )	( )	( )	( )	( )

7a. What brand or manufacturer's fillings do you use most often? (Choose one)
(If you do not use prepared fillings, skip to question 8)

a) _____ Code b) _____ Comstock c) _____ Globe d) _____ Kraft
e) _____ Lawrence f) _____ Lucky Leaf g) _____ Nugget h) _____ Sysco
i) _____ Thank You j) _____ White House k) _____ Wilderness l) _____ Other (Please Specify)

7b. Please state why you use the brand mentioned above: (Check all that apply)

a) _____ Leader in Industry b) _____ Bakery Expertise c) _____ Well Known Name
d) _____ Best Product Quality e) _____ Variety of Flavors f) _____ Good Service
g) _____ Good Reputation h) _____ Good Package Options i) _____ Other (Please Specify)

7c. Please rate the following brands: (Please answer with your best opinion, even on those not used)

	Out Standing	Very Good	Good	Fair	Poor	Not Familiar
a) Code	( )	( )	( )	( )	( )	( )
b) Comstock	( )	( )	( )	( )	( )	( )
c) Globe	( )	( )	( )	( )	( )	( )
d) Kraft	( )	( )	( )	( )	( )	( )
e) Lawrence	( )	( )	( )	( )	( )	( )
f) Lucky Leaf	( )	( )	( )	( )	( )	( )
g) Nugget	( )	( )	( )	( )	( )	( )
h) Sysco	( )	( )	( )	( )	( )	( )
i) Thank You	( )	( )	( )	( )	( )	( )
j) White House	( )	( )	( )	( )	( )	( )
k) Wilderness	( )	( )	( )	( )	( )	( )
l) Other (Please Specify)	( )	( )	( )	( )	( )	( )

8. If you don't use canned (or prepared) fruit fillings and toppings, please check your reason(s) why - check all that apply:

a) _____ Difficult to store
b) _____ Cost is too high
c) _____ Use other types of fillings
d) _____ Difficult to use
e) _____ Poor quality
f) _____ High waste cost of unused portion
g) _____ Can't use enough to justify purchase and inventory
h) _____ Other (please specify) _____

9. Suppose there was a higher quality prepared fruit filling or topping available on the market today.

	Level of Interest				
	Extremely	Very	Somewhat	Not Very	Not at All
a. Would you be more inclined to purchase?	( )	( )	( )	( )	( )
b. Would you be willing to pay a higher price?	( )	( )	( )	( )	( )

c. How much more would you be willing to pay?

a) _____ 10% b) _____ 15% c) _____ 20% d) _____ 25% e) _____ 30%

10. In purchasing fruit fillings or toppings, please rate the following characteristics that influence your decision to purchase:

	Level of Importance				
	Extremely	Very	Important	Somewhat	Not Important
a) Extended Shelf Life	( )	( )	( )	( )	( )
b) Improved Packaging Options	( )	( )	( )	( )	( )
c) Providing Variety of Flavors in One Case	( )	( )	( )	( )	( )
d) Appearance	( )	( )	( )	( )	( )
e) Consistency of Quality	( )	( )	( )	( )	( )
f) Customer Appeal	( )	( )	( )	( )	( )
g) Flavor	( )	( )	( )	( )	( )
h) Fruit Quality	( )	( )	( )	( )	( )
i) Performance	( )	( )	( )	( )	( )
j) Texture	( )	( )	( )	( )	( )
k) Improved Pricing Structure	( )	( )	( )	( )	( )
l) Control Waste of Unused Portion	( )	( )	( )	( )	( )
m) Other (Please Specify)	( )	( )	( )	( )	( )

11. Suppose prepared fruit fillings were available in a shelf stable container similar to a 1/2 gallon (gable top) milk carton, please indicate your level of interest in rating the following questions:

	Level of Interest				
	Extremely	Very	Somewhat	Not Very	Not at All
a) Would purchase the product if available in the above container.	( )	( )	( )	( )	( )
b) Can easily reseal the unused portion in the original container for storage.	( )	( )	( )	( )	( )
c) Suppose a variety of flavors were available in one case.	( )	( )	( )	( )	( )
d) How inclined would you be to pay a higher price for these types of conveniences?	( )	( )	( )	( )	( )

(OVER)

12. Please rate the following container/package criteria when purchasing food products for your operation:

	Level of Importance				
	Extremely	Very	Important	Somewhat	Not Important
a) Control Waste of Product	( )	( )	( )	( )	( )
b) Efficiency in Storage Space	( )	( )	( )	( )	( )
c) Convenience in Opening	( )	( )	( )	( )	( )
d) Convenience in Dispensing	( )	( )	( )	( )	( )
e) Convenience in Resealing	( )	( )	( )	( )	( )
f) Portion Size	( )	( )	( )	( )	( )
g) Cost	( )	( )	( )	( )	( )
h) Extended Shelf Life	( )	( )	( )	( )	( )
i) Inventory Control	( )	( )	( )	( )	( )
j) Disposing of Container/ Package Waste	( )	( )	( )	( )	( )
k) Preserving Nutrition	( )	( )	( )	( )	( )
l) Storage and Preparation Information	( )	( )	( )	( )	( )
m) Other (Please Specify)	( )	( )	( )	( )	( )

APPENDIX D

TABLE A

Samples by State

Commercial and Non-Commercial Foodservice Operations

State	Fast Food	Full Service	Commercial Cafeteria	Lodging	Primary/ Secondary School	Hospital/ Nursing Home	Business/ Industry	College	Total
New Hampshire	1	1	0	0	2	2	2	2	10
Connecticut	1	2	2	1	6	4	6	2	24
Pennsylvania	5	6	5	6	15	15	13	13	78
Maryland	3	3	2	2	3	4	4	5	26
N. Carolina	4	4	5	3	3	5	8	6	38
Florida	8	8	11	14	5	9	8	4	67
Mississippi	1	0	2	1	3	2	0	2	11
Indiana	4	3	5	4	6	7	6	9	44
Wisconsin	4	4	2	3	9	8	7	7	44
N. Dakota	0	0	1	1	4	2	0	1	9
Missouri	4	3	3	4	6	7	7	4	38
Louisiana	4	2	4	2	2	3	1	2	20
Texas	13	8	18	8	11	10	12	9	89
Idaho	0	1	0	0	1	0	0	1	3
N. Mexico	2	1	2	1	1	1	1	1	10
Hawaii	0	1	0	3	1	1	0	1	9
Washington	3	4	4	2	5	4	1	7	30
Massachusetts	2	4	2	3	7	7	12	7	44
Maine	1	1	1	1	2	1	1	3	11
New Jersey	3	5	2	5	8	7	12	4	46
Delaware	1	1	1	0	1	1	3	0	8
Virginia	3	3	3	5	4	4	4	6	32

TABLE A (cont.)

Samples by State

Commercial and Non-Commercial Foodservice Operations

State	Fast Food	Full Service	Commercial Cafeteria	Lodging	Primary/ Secondary School	Hospital/ Nursing Home	Business/ Industry	College	Total
S. Carolina	3	2	2	2	3	2	3	3	20
Alabama	2	2	3	1	4	3	3	3	21
Kentucky	2	2	2	2	4	3	3	2	22
Michigan	5	6	5	4	13	8	10	12	63
Minnesota	2	3	2	4	3	6	6	7	33
Montana	0	1	0	1	1	1	0	1	5
Kansas	3	1	2	1	4	3	2	4	20
Arkansas	2	1	3	1	2	2	0	1	12
Colorado	3	3	3	3	1	2	4	4	23
Utah	2	0	1	1	1	1	0	2	8
Nevada	1	0	0	4	0	0	2	7	7
Alaska	1	0	0	1	0	1	0	0	3
Rhode Island	0	0	0	1	1	1	1	2	6
Vermont	0	1	0	1	1	1	0	1	5
New York	6	11	6	9	18	18	20	19	107
D.C.	0	1	1	2	0	0	1	1	6
W. Virginia	1	1	2	1	1	2	0	1	9
Georgia	5	4	7	4	6	4	2	3	35
Tennessee	4	3	5	3	3	4	5	2	29
Ohio	6	7	6	4	16	14	10	9	72
Iowa	2	2	2	2	3	5	2	8	26
S. Dakota	1	1	0	0	1	0	0	1	4

TABLE A (cont.)

Samples by State

Commercial and Non-Commercial Foodservice Operations

State	Fast Food	Full Service	Commercial Cafeteria	Lodging	Primary/ Secondary School	Hospital/ Nursing Home	Business/ Industry	College	Total
Illinois	8	9	7	8	12	15	22	14	95
Nebraska	1	1	1	1	2	3	1	3	13
Oklahoma	3	2	3	2	2	2	1	3	18
Wyoming	1	0	0	1	1	1	0	1	5
Arizona	1	3	1	3	1	2	3	1	15
California	14	16	10	12	12	15	18	17	114
Oregon	3	2	1	2	3	2	0	2	15

TABLE B

Response Rate by Geographic Region and State

Region	State	Response Percentage
Midwest	Ohio	6.5
Midwest	Illinois	5.1
Midwest	Michigan	4.6
Midwest	Wisconsin	3.6
Midwest	Missouri	3.0
Midwest	Indiana	2.2
Midwest	Iowa	2.2
Midwest	Kansas	2.0
Midwest	Minnesota	2.0
Midwest	South Dakota	.6
Midwest	Nebraska	.4
TOTAL MIDWEST PERCENTAGE OF RETURNED SAMPLES		32.2

TABLE B (cont.)

Response Rate by Geographic Region and State

Region	State	Response Percentage
Northeast	New York	8.1
Northeast	Pennsylvania	7.3
Northeast	New Jersey	2.6
Northeast	Massachusetts	2.4
Northeast	Maryland	1.8
Northeast	Maine	1.2
Northeast	Connecticut	1.0
Northeast	New Hampshire	.6
Northeast	Vermont	.6
Northeast	District of Columbia	.2
TOTAL NORTHEAST PERCENTAGE OF RETURNED SAMPLES		25.8

TABLE B (cont.)

Response Rate by Geographic Region and State

Region	State	Response Percentage
Southwest	California	6.7
Southwest	Texas	5.3
Southwest	Colorado	2.2
Southwest	Oklahoma	1.4
Southwest	New Mexico	1.2
Southwest	Arkansas	1.0
Southwest	Louisiana	1.0
TOTAL SOUTHWEST PERCENTAGE OF RETURNED SAMPLES		20.2

TABLE B (cont.)

Response Rate by Geographic Region and State

Region	State	Response Percentage
Southeast	Florida	3.6
Southeast	Georgia	2.2
Southeast	North Carolina	2.0
Southeast	Virginia	2.0
Southeast	Tennessee	1.8
Southeast	South Carolina	1.6
Southeast	Alabama	1.4
Southeast	Kentucky	1.4
Southeast	Mississippi	1.4
Southeast	West Virginia	.4
TOTAL SOUTHEAST PERCENTAGE OF RETURNED SAMPLES		17.8

TABLE B (cont.)

Response Rate by Geographic Region and State

Region	State	Response Percentage
Northwest	Washington	1.6
Northwest	North Dakota	.8
Northwest	Oregon	.6
Northwest	Montana	.4
Northwest	Wyoming	.4
Northwest	Alaska	.2
TOTAL NORTHWEST PERCENTAGE OF RETURNED SAMPLES		4.0